

WHAT IS CLAIMED IS:

1. A method for enhanced synthesis of biological macromolecules *in vitro*, the method comprising:

synthesizing said biological macromolecules in a reaction mix including a phosphate-free energy source, in the presence of exogenous phosphate.

2. The method of Claim 1, wherein said phosphate free energy source is glucose.

3. The method of Claim 1, wherein said phosphate free energy source is glutamate.

4. The method of Claim 1, wherein said phosphate free energy source is pyruvate.

5. The method of Claim 1, wherein said phosphate is present at a concentration of from about 1 mM to about 20 mM.

6. The method of Claim 5, wherein said phosphate is provided as potassium phosphate, magnesium phosphate, or ammonium phosphate.

7. The method of Claim 1, wherein said phosphate is provided in a source that is released during the reaction.

8. The method according to Claim 1, wherein said reaction mix comprises nucleoside monophosphates.

9. The method according to Claim 8, wherein said synthesis is performed the absence of exogenous nucleotide triphosphates.

10. The method of Claim 8, wherein said synthesis of biological macromolecules comprises translation of mRNA to produce polypeptides.

11. The method of Claim 10, wherein said synthesis also comprises transcription of mRNA from a DNA template.

12. The method of Claim 1 wherein said synthesis of biological macromolecules is performed as a batch reaction.

13. The method of Claim 1, wherein said synthesis of biological macromolecules is performed as a continuous reaction.

14. The method of Claim 1, wherein said reaction mix comprises an extract from *E. coli* grown in glucose containing medium.

15. The method of Claim 14, wherein said *E. coli* are grown in glucose and phosphate containing medium.

16. The method of Claim 1, wherein said reaction mix comprises magnesium at a concentration of from about 5 mM to about 20 mM.

17. The method of Claim 1, wherein said reaction mix is substantially free of polyethylene glycol.

18. The method according to Claim 17, wherein said reaction mix comprises one or more of spermine, spermidine and putrescine.